Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (original) An optical disk apparatus that reads predetermined information including address information for determining a position and wobble information from an optical disk having tracks in which information is to be recorded and that form a wobble of a predetermined cycle and gap portions between the tracks in which the address information is recorded, the optical disk apparatus comprising:

an optical head having a tracking detector for detecting a first detection signal and a second detection signal by first and second detectors, respectively, arranged on both sides of a dividing line that extends in a longitudinal direction of the tracks, based on reflected light of a laser beam irradiated onto the optical disk;

a wobble detection balance adjustment circuit for receiving the first detection signal and the second detection signal, making an adjustment so that a signal level of the first detection signal is equal to a signal level of the second detection signal, and outputting the respective detection signals;

a wobble detection differential circuit for generating a wobble detection differential signal indicating a difference between the first detection signal and the second detection signal whose signal levels have been adjusted by the wobble detection balance adjustment circuit;

an analog-to-digital conversion circuit for digitizing the wobble detection differential signal generated by the wobble detection differential circuit;

a wobble signal detection circuit for detecting a wobble signal based on the wobble detection differential signal digitized by the analog-to-digital conversion circuit;

an adder circuit for generating a sum signal indicating a sum of the first detection signal and the second detection signal whose signal levels have been adjusted by the wobble detection balance adjustment circuit;

a binarization circuit for comparing the sum signal generated by the adder circuit with a predetermined level of signal, and converting the sum signal into a binarized signal;

a latch circuit for latching the output signal from the binarization circuit with a conversion clock of the analog-to-digital conversion circuit or a clock with a frequency that is an integral multiple of a frequency of the conversion clock, and converting the output signal into a recording timing signal;

a control signal generation circuit for generating a control signal for removing a residual signal component as a residual component of a recording signal included in the digitized wobble detection differential signal, based on the recording timing signal output from the latch circuit and the digitized wobble detection differential signal;

a residual component removal circuit for removing the residual signal component included in the digitized wobble detection difference signal based on the control signal supplied from the control signal generation circuit, so as to extract a land pre-pit detection signal; and

an address detection circuit for detecting the address information based on the land pre-pit detection signal output from the residual component removal circuit.

2. (original) An optical disk apparatus that reads predetermined information including address information for determining a position and wobble information from an optical disk having tracks in which information is to be recorded and that forms a wobble of a predetermined cycle and gap portions between the tracks in which the address information is recorded, the optical disk apparatus comprising:

an optical head having a tracking detector for detecting a first detection signal and a second detection signal by first and second detectors, respectively, arranged on both sides of a dividing line that extends in a longitudinal direction of the tracks, based on reflected light of a laser beam irradiated onto the optical disk;

a recording signal generation circuit for generating a recording signal for recording information in the tracks;

a laser driving circuit for driving a laser of the optical head based on the recording signal output from the recording signal generation circuit;

a reproduction signal generation circuit for detecting the recording signal recorded in the tracks, and outputting a reproduction signal;

a wobble detection balance adjustment circuit for receiving the first detection signal and the second detection signal, making an adjustment so that a signal level of the first detection signal is equal to a signal level of the second detection signal, and outputting the respective detection signals;

a wobble detection differential circuit for generating a wobble detection differential signal indicating a difference between the first detection signal and the second detection signal whose signal levels have been adjusted by the wobble detection balance adjustment circuit;

an analog-to-digital conversion circuit for digitizing the wobble detection differential signal generated by the wobble detection differential circuit;

a wobble signal detection circuit for detecting a wobble signal based on the wobble detection differential signal digitized by the analog-to-digital conversion circuit;

a control signal generation circuit for generating a control signal for removing a residual signal component as a residual component of a recording signal included in the digitized wobble detection differential signal based on a recording timing signal obtained based on at least one of the output signals from the recording signal generation circuit and the reproduction signal generation circuit and the wobble detection differential signal;

a residual component removal circuit for removing the residual signal component included in the digitized wobble detection difference signal based on the control signal supplied from the control signal generation circuit, so as to extract a land pre-pit detection signal; and

an address detection circuit for detecting the address information based on the land pre-pit detection signal output from the residual component removal circuit.

3. (currently amended) The optical disk apparatus according to claim 1 ~~or 2~~, further comprising: an amplitude detection circuit for detecting an amplitude of a mixed signal of the wobble signal included in the digitized wobble detection differential signal and the residual signal component correlated with the sum signal, the recording signal, or the reproduction signal,

wherein the wobble detection balance adjustment circuit includes a first gain variable amplifier for varying the level of the first detection signal, and a second gain variable amplifier for varying the level of the second detection signal, and

the wobble detection balance adjustment circuit has a first function of adjusting a gain of the first gain variable amplifier and a gain of the second gain variable amplifier so that the level of the first detection signal is equal to the level of the second detection signal, a second function of adjusting the gains of the first gain variable amplifier and the second gain variable amplifier so that the mixed signal is input to the analog-to-digital conversion circuit at a predetermined level based on the output from the amplitude detection circuit, and a third function of making the gains of the first gain variable amplifier and the second gain variable amplifier constant when reproduction is performed from a track in which the recording signal is not recorded.

4. (currently amended) The optical disk apparatus according to claim 1 ~~or 2~~,

wherein the control signal generation circuit generates as the control signal an approximate residual signal that is approximate to the residual signal component, and

the residual component removal circuit subtracts the approximate residual signal from the residual signal component having the same polarity as that of the land pre-pit.

5. (original) The optical disk apparatus according to claim 4, wherein the approximate residual signal is a signal generated by approximating a recording signal waveform based on a write strategy adopted by the optical disk apparatus to that of the wobble detection differential signal that has passed through the recording/reproduction system and the signal processing system of the optical disk apparatus.

6. (original) The optical disk apparatus according to claim 3,

wherein the control signal generation circuit generates as the control signal an approximate residual signal that is approximate to the residual signal component, and sets an amplitude of the approximate residual signal based on the output from the amplitude detection circuit; and

the residual component removal circuit subtracts the approximate residual signal from the residual signal component having the same polarity as that of the land pre-pit.

7. (original) The optical disk apparatus according to claim 4, wherein when a waveform obtained as a result of the subtraction by the residual component removal circuit includes a portion exceeding a predetermined level, the portion exceeding the predetermined level is replaced by a reference level signal.

8. (currently amended) The optical disk apparatus according to claim 1 ~~or 2~~, wherein the residual component removal circuit replaces the residual signal component included in the digitized wobble detection differential signal with a reference level signal during a period corresponding to the recording timing signal.

9. (currently amended) The optical disk apparatus according to claim 7 ~~or 8~~, wherein the reference level signal is a signal generated based on a low-frequency component in a portion that does not correspond to the residual signal component in the digitized wobble detection differential signal.

10. (currently amended) The optical disk apparatus according to claim 1 ~~or 2~~, wherein during a period in which the land pre-pit signal is located at a position where a recording signal is detected, a signal that is not subjected to the processing of removing the residual signal component is used as the land pre-pit detection signal.

11. (original) The optical disk apparatus according to claim 2, wherein the control signal generation circuit includes an optimum timing detection circuit for generating a plurality of test timing signals by shifting a timing of the recording timing signal in units of clock, comparing levels of the residual signal component in the digitized wobble detection differential signal in periods corresponding to the respective test timing signals, and selecting a test timing signal corresponding to a period in which the absolute value level of the residual signal component is the highest, and uses the selected test timing signal as the recording timing signal for generating the control signal.

12. (original) The optical disk apparatus according to claim 11, wherein the optimum timing detection circuit selects one of the test timing signals arbitrarily, cumulatively adds values obtained by subtracting an absolute value level of the residual signal component corresponding to the selected test timing signal from absolute value levels of the residual signal component corresponding to test timing signals before and after the selected test timing signal, respectively, and, when either of the cumulative values reaches a predetermined positive level, selects a test timing signal on a side of the cumulative value that reaches the predetermined positive level as an output signal, and performs the above processing repeatedly with respect to the selected test timing signal.

13. (new) The optical disk apparatus according to claim 2, further comprising: an amplitude detection circuit for detecting an amplitude of a mixed signal of the wobble signal included in the digitized wobble detection differential signal and the residual signal component correlated with the sum signal, the recording signal, or the reproduction signal,

wherein the wobble detection balance adjustment circuit includes a first gain variable amplifier for varying the level of the first detection signal, and a second gain variable amplifier for varying the level of the second detection signal, and

the wobble detection balance adjustment circuit has a first function of adjusting a gain of the first gain variable amplifier and a gain of the second gain variable amplifier so that the level of the first detection signal is equal to the level of the second detection signal, a second function of adjusting the gains of the first gain variable amplifier and the second gain variable amplifier so that the mixed signal is input to the analog/digital conversion circuit at a predetermined level based on the output from the amplitude detection circuit, and a third function of making the gains of the first gain variable amplifier and the second gain variable amplifier constant when reproduction is performed from a track in which the recording signal is not recorded.

14. (new) The optical disk apparatus according to claim 2,

wherein the control signal generation circuit generates an approximate residual signal that is approximate to the residual signal component as the control signal, and

the residual component removal circuit subtracts the approximate residual signal from the residual signal component having the same polarity as that of the land pre-pit.

15. (new) The optical disk apparatus according to claim 14, wherein the approximate residual signal is a signal generated by approximating a recording signal waveform based on a write strategy adopted by the optical disk apparatus to that of the wobble detection differential signal that has passed through the recording/reproduction system and the signal processing system of the optical disk apparatus.

16. (new) The optical disk apparatus according to claim 13,

wherein the control signal generation circuit generates an approximate residual signal that is approximate to the residual signal component as the control signal, and sets an amplitude of the approximate residual signal based on the output from the amplitude detection circuit; and

the residual component removal circuit subtracts the approximate residual signal from the residual signal component having the same polarity as that of the land pre-pit.

17. (new) The optical disk apparatus according to claim 14, wherein when a waveform obtained as a result of the subtraction by the residual component removal circuit includes a portion exceeding a predetermined level, the portion exceeding the predetermined level is replaced by a reference level signal.

18. (new) The optical disk apparatus according to claim 2, wherein the residual component removal circuit replaces the residual signal component included in the digitized wobble detection differential signal with a reference level signal during a period corresponding to the recording timing signal.

19. (new) The optical disk apparatus according to claim 17, wherein the reference level signal is a signal generated based on a low-frequency component in a portion that

does not correspond to the residual signal component in the digitized wobble detection differential signal.

20. (new) The optical disk apparatus according to claim 8, wherein the reference level signal is a signal generated based on a low-frequency component in a portion that does not correspond to the residual signal component in the digitized wobble detection differential signal.

21. (new) The optical disk apparatus according to claim 18, wherein the reference level signal is a signal generated based on a low-frequency component in a portion that does not correspond to the residual signal component in the digitized wobble detection differential signal.

22. (new) The optical disk apparatus according to claim 2, wherein during a period in which the land pre-pit signal is located at a position where a recording signal is detected, a signal that is not subjected to the processing of removing the residual signal component is used as the land pre-pit detection signal.